

Offering a brief look at the vital research and development contributions made by the Small Business Innovation Research (SBIR) Program in direct support of the Air Force mission.

## Air Force SBIR Update



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# The New Millennium in SBIR

by Stephen Guilfoos



As we venture forward into the 21st Century, we all have the opportunity for new beginnings. We all wonder what these opportunities will bring. Will it be the same old things, or will there be major changes, or will the future lie somewhere in-between those extremes? Here's what I see for the future of the Air Force SBIR Program.

### Less money – Fewer topics

The changing face of R&D budgets will probably mean fewer SBIR topics. The recent trend is for the Air Force Science and Technology budgets to become tighter. This means more belt-tightening both in the number of scientists and engineers working for the Air Force and for the amounts of money available for external R&D contracting. This means fewer dollars available for SBIR and fewer dollars ultimately mean fewer topics.

Topics will be more focused on near-term technology

needs. The drawdown in the number of topics means each remaining topic increases in value to the Air Force. As such, we need to become more responsive to the needs of our warfighters — the ultimate users of our technologies. This means focusing on developing technologies that can be used (now) in the near term future, not those that are 25 to 50 years downstream. Even with this near-term focus, the Air Force SBIR Program will always attempt to maintain a small percentage of its topics as forward thinking and looking toward the Air Force needs of the future.

### Increased focus on commercialization

We will increase our emphasis on Phase III efforts for commercialization into military markets. With SBIR becoming more responsive to the near-term warfighter requirements, we will need to find more efficient methods of commercializing our Phase II technologies.

### Stronger ties to prime contractors and system integrators

Some of the acquisition reforms that helped streamline contracting with primes and system integrators may cause more challenges to the small business community.



Continued on page 4...

## SBIR Tech Issues

*Tech Issues* is intended for personnel directly involved in the operation and support of the AF SBIR program.

### SBIR "Fast Track" Accelerates Forward

The SBIR "Fast Track" policy offers prospective investors a major new opportunity to leverage their investments in small technology companies working on R&D projects with defense and commercial applications. This is because, under the Fast Track, a small company can offer an investor the opportunity to obtain a match of between one to four dollars in SBIR funds for every one dollar the investor puts in.

The Air Force continues to increase its emphases on SBIR Fast Track. Fast Track promises SBIR contractors who obtain matching funds from outside investors and qualify for the SBIR Fast Track the following:

- interim funding of \$30,000 to \$50,000 between Phase I and II;
- evaluation for Phase II award under a separate, expedited process; and
- selection for Phase II award provided they meet or exceed a threshold of "technically sufficient" and have substantially met their Phase I technical goals.

To increase Air Force Fast Track participation during the 99.1 SBIR solicitation, the Air Force sent a letter to all 99.1 Phase I awardees re-stating the benefits of the Fast Track policy. The benefits of the Fast Track policy also continue to be emphasized to small businesses at every opportunity. These efforts resulted in doubling the number of Air Force Fast Track applications for the 99.1 SBIR solicitation.

To participate in the Fast Track program, the SBIR Phase I award-winning



small business must submit a Fast Track application. In the Fast Track application, the small business and investor state that the investor will match SBIR funding in cash, contingent on the company's selection for Phase II award. DoD's SBIR Fast Track policy first took effect with the 96.1 SBIR solicitation. The following is complete data since the implementation of the policy:

- 125 Phase I projects qualified for the Fast Track by attracting the required cash investment from an outside investor.
- 93 percent of these (i.e., 117 projects) were selected for Phase II award. By contrast, on average 40 percent of all DoD Phase I projects are selected for Phase II award.
- Most Fast Tracks experience no significant gap in funding.
- Approximately 70 percent of Fast Track companies have never received a Phase II SBIR award.
- In aggregate, under the Fast Track, \$88 million in DoD SBIR funds have leveraged at least \$43 million in matching cash from outside investors.
- Over 70 percent of the outside investors are from the private sector.

## SBIR Facts & Figures

The top ten technology areas funded by the DoD SBIR program in FY 1998  
(in thousands of dollars)

1. Electronic Device Performance .....	\$582,319
2. Advanced Materials .....	\$579,866
3. Electromagnetic Radiation/Propagation .....	\$279,629
4. Computer and Communications Systems .....	\$208,335
5. Optical Devices and Lasers .....	\$144,897
6. Mechanical Performance of Structures and Equipment .....	\$97,680
7. Information Processing and Management .....	\$93,473
8. Signal and Image Processing .....	\$86,890
9. Microelectronics .....	\$84,771
10. Electronic Equipment and Instrumentation .....	\$78,242

## AF SBIR Impact

# New Helmet-Mounted Imaging System Seen as Important Battlefield Equipment

### Air Force Requirement

The Air Force was searching for a new helmet-mounted, Long Wavelength Infrared (LWIR) imaging system.

This system can be used to help military members more clearly locate a person and other objects through dense smoke or dust — conditions typically encountered during fires or in wartime action. The system also provides the capability for relay of accurate target imagery to commanders located away from the action. Commanders, in turn, could send video and audio to their troops in the field using this system.

### SBIR Technology

Using SBIR Phase I and II contracts, Zybron, Inc. developed an infrared imaging system that can detect and display minute temperature differences of 0.07° C in different areas of a target or between different targets such as combustion areas, human beings, and furniture.

The system features high-quality wireless video and audio link between the frontlines and the rear; voice activated, hands free switching; and automatic target recognition. The voice transmission is from a thin film pressed against the user's forehead, not

from a microphone near the user's mouth. Therefore, military forces and firefighters wearing masks are able to talk with others through wireless communication clearly because large environmental noises can not get into the thin film.

### Payoff

Warfighters will be able to search a dust- and smoke-filled battlefield with "hands-free" technology. Military firefighters will be able to find and remove unconscious victims from smoke-filled rooms in as little as two minutes, saving precious time and giving the victims a second chance at life.

Firefighters usually carry heavy backpacks to help them breathe in smoky areas. They also wear masks and thick protective clothing against the heat. The new sensor system developed through the Air Force SBIR Program weighs only two pounds, including battery. It can be worn totally self-contained on top of the firefighter's helmet, while not obscuring vision.

The new helmet system does not have parallax or dead angle between the IR camera and the viewer, therefore, it will be an ideal tool to help medical doctors perform battlefield surgery without any light.

In the future, Air Force pilots may use variations of the helmet-mounted system to locate enemy aircraft — even stealthy models — and ground targets by day or night, in all kinds of weather, and take defensive or offensive action.

### Technology Transfer/Commercialization

The technology developed by Zybron, Inc. has already generated military and commercial contracts valued at \$1.5 million dollars. The company anticipates many military and commercial applications for the system including the U.S. Army and Marines, the U.S. border patrols, the U.S. Special Forces operations, and U.S. security guards.

The company also sees applications in industry, agriculture, medicine, construction, and fine arts. Examples of possible commercial use include:

- to monitor temperature controls during manufacturing production of better-quality steel;
- to check moisture content of products for continuous quality control in paper mills;

- to locate short-circuits in remote wires and low oil level in remote transformers in power plants;
- to check thermal insulation of homes for window manufacturers, and
- to detect vascular disease and monitor open heart surgery for medical diagnosis.

### SBIR Partner

Zybron, Inc.  
Beavercreek, OH

### Employees

15



"Zybron's technology will enable the firefighter to see through fog and smoke allowing them to rescue victims in shorter times and thus increasing their chance of surviving a fire. Zybron's technology enables AF firefighters to use it to retrieve critical assets in crash fire rescue situations.

The improvements in resolution, reliability and low cost along with communication interfaces with command and control centers makes this technology a true transition success for the Air Force."

Juan A. Vitali, Ph.D.  
SBIR Project Officer  
Team Leader, Fire  
Research Group  
AFRL/MLQC



## Air Force SBIR Update

Continued from front page...

We see a need for a stronger relationship with weapon system prime contractors and their system integrators. One possible method of improving commercialization is to increase our tie-in with the weapon system prime contractors and the system integrators throughout the SBIR process. This may mean more partnering between the Air Force science and technology community and the prime contractors during the topic generation process. We need to be able to "plus" upon the existing relationships these large aerospace companies already have with small businesses.

### Targeting space technology

With AFRL's increasing efforts to focus on space programs, a greater percentage of our topics will be based in the space thrust. It is only natural that the SBIR program lead the way in helping to evolve new focuses in science and technology.

### "Fast Track" gains momentum

We will be trying to increase the number of our Phase I award winners to consider using the Fast Track program. Even though the program is in its early years, it is showing great success. We need to get more small businesses to consider using Fast Track to leverage the work efforts.

### Management processes overhauled

We will see more emphasis on improving the internal SBIR management processes. I envision revamping our internal SBIR processes to become better attuned with all the other changes the new millennium will bring. Doing things the "same old way" may very well doom us to continue repeating our same old mistakes. New program changes dictate that we must reevaluate our process and make those changes that make us more efficient while we become more responsive to all our customers.

### Small business plays larger role

Lastly, we will see a growing importance of the small business sector in all aspects of Air Force procurements. I see the Air Force finding more ways of using the small business community to meet our diverse needs. It simply makes more sense to find solutions from multiple sources as the face of the "military industrial complex" changes — and small businesses might just be that source.

The old adage — "lead, follow, or get out of the way" — applies as we transition to the new millennium. The Air Force SBIR program chooses to "lead."



### Air Force SBIR Advantage

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The goal of the Air Force SBIR Program is to serve the technology needs of Air Force warfighters. It accomplishes its mission as part of the Air Force Research Laboratory's (AFRL) integrated research and development (R&D) team. AFRL's mission is to be the Air Force agent for identifying and providing advanced, affordable and integrated technologies that keep our Air Force the best in the world.

*SBIR Advantage* is published quarterly by the Air Force SBIR Program office. This publication offers an overview of AF SBIR issues and information. The purpose of *SBIR Advantage* is to provide Air Force, DoD, and other government leadership with additional insight into the vital contributions made by the SBIR program to Air Force R&D.

*SBIR Advantage* is available online at:  
[www.afrl.af.mil/sbir/index.htm](http://www.afrl.af.mil/sbir/index.htm)

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